MATERIAL SCIENCE SERVICE

汎銓科技 AI晶片分析平台

www.msscorps.com

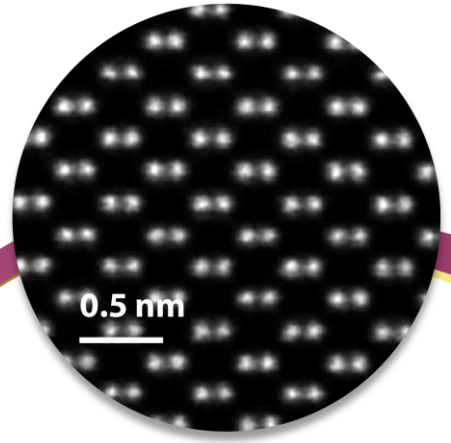
Msscorps (6830) 2026 Operational Outlook

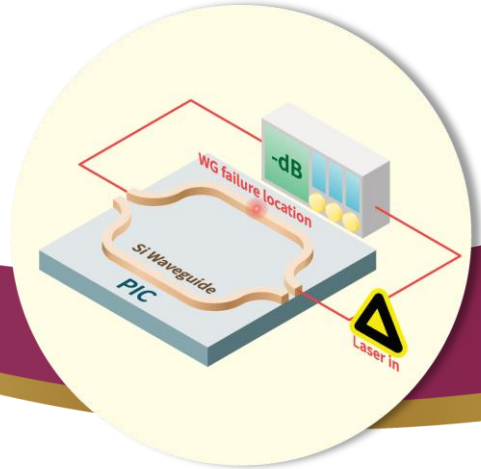
Four Engines Ignited, Revenue Momentum in Full Swing

MSS‘s Four Major Growth Engines for 2026

Global deployment (Taiwan+US+Japan+China)

Expanding the AI client zone





Angstrom-era process material analysis

The "Silicon Photonics Engineering Division," in addition to having self-development and assembled three silicon photonics analysis equipment units (which have received patents in Taiwan, Japan, and the United States), will also respond to customer demands. It plans to further launch silicon photonics testing equipment suitable for production (PD) and quality assurance (QA) applications in 2026. This marks an official extension from providing services to equipment sales and licensing, thereby establishing a new operational model.

Global Footprint — Connecting Service Locations Worldwide, All Growth Engines Fired Up for 2026

- **Strategic Priority: Ensuring Supply Chain Security**
  - ➢ Actively fostering a resilient domestic semiconductor ecosystem to mitigate the risk of future chip shortages
- **Growth Strategy: Replicating Hsinchu's Success Model Globally**
  - ➢ Systematically implement validated operational and innovation frameworks across global laboratories

HQ Expansion

SiPh testing and fault isolation analysis zone

HQ + Zhubei 2nd lab

Materials analysis for advanced nodes

Zhubei 1st lab

AI Client Zone

SAC-TEM Center

Angstrom-era materials analysis

Shenzhen Branch

Official service operations in August 2025

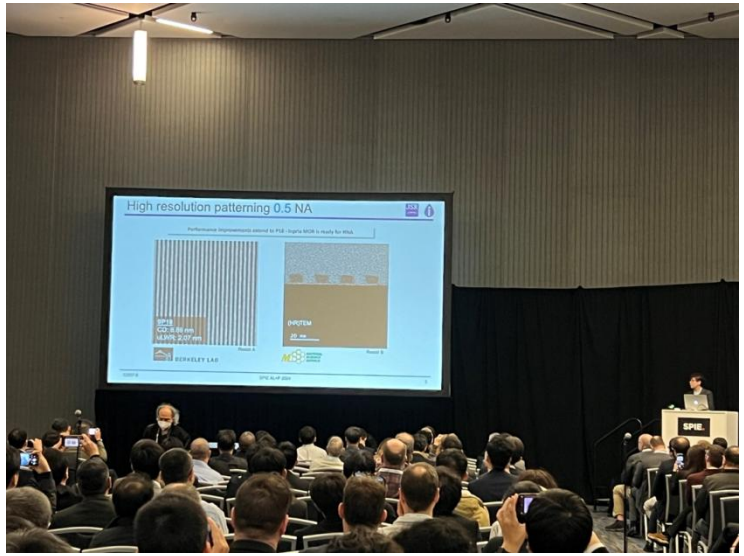
Japan location

Official service operations in September 2025

US location

Official service operations in September 2025

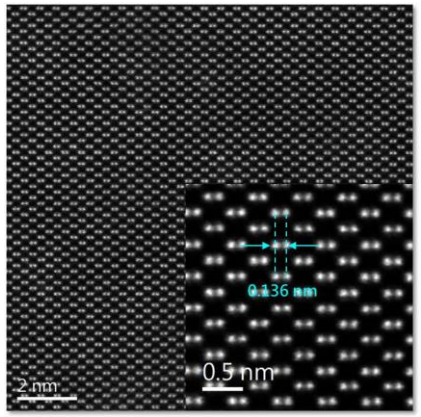
Angstrom-era process materials analysis



International presentation of *High-NA* photo resistor analysis by our clients

- Collaborate with semiconductor industry leaders to participate in next-generation process R&D
- Utilize state-of-the-art aberration-corrected STEM to advance cutting-edge material analysis
- Pioneer innovative analysis techniques to solidify industrial competitive advantage

Cs-corrected STEM@SAC

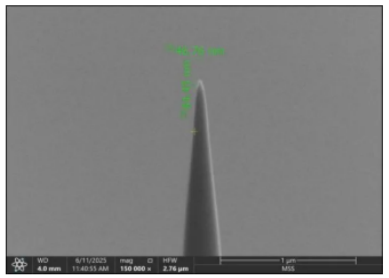


Home » Test & Measurement » Atom Probe Tomography: An Advanced Materials Characterization Technique for Next-Gen Semiconductor Technologies

Atom Probe Tomography: An Advanced Materials Characterization Technique for Next-Gen Semiconductor Technologies

Article By : MSSCORPS Co. Ltd

Category : Test & Measurement | 2025-12-15 | (0) Comments | Ask question of embedded



Demands for analytical spatial resolution and chemical sensitivity intensify as transistor dimensions near atomic scales and 3D integration become even more complex.

Chip analysis at the atomic scale: meeting the next-generation semiconductor's stringent demands for spatial resolution and chemical sensitivity!

Technical paper for new analytical technology

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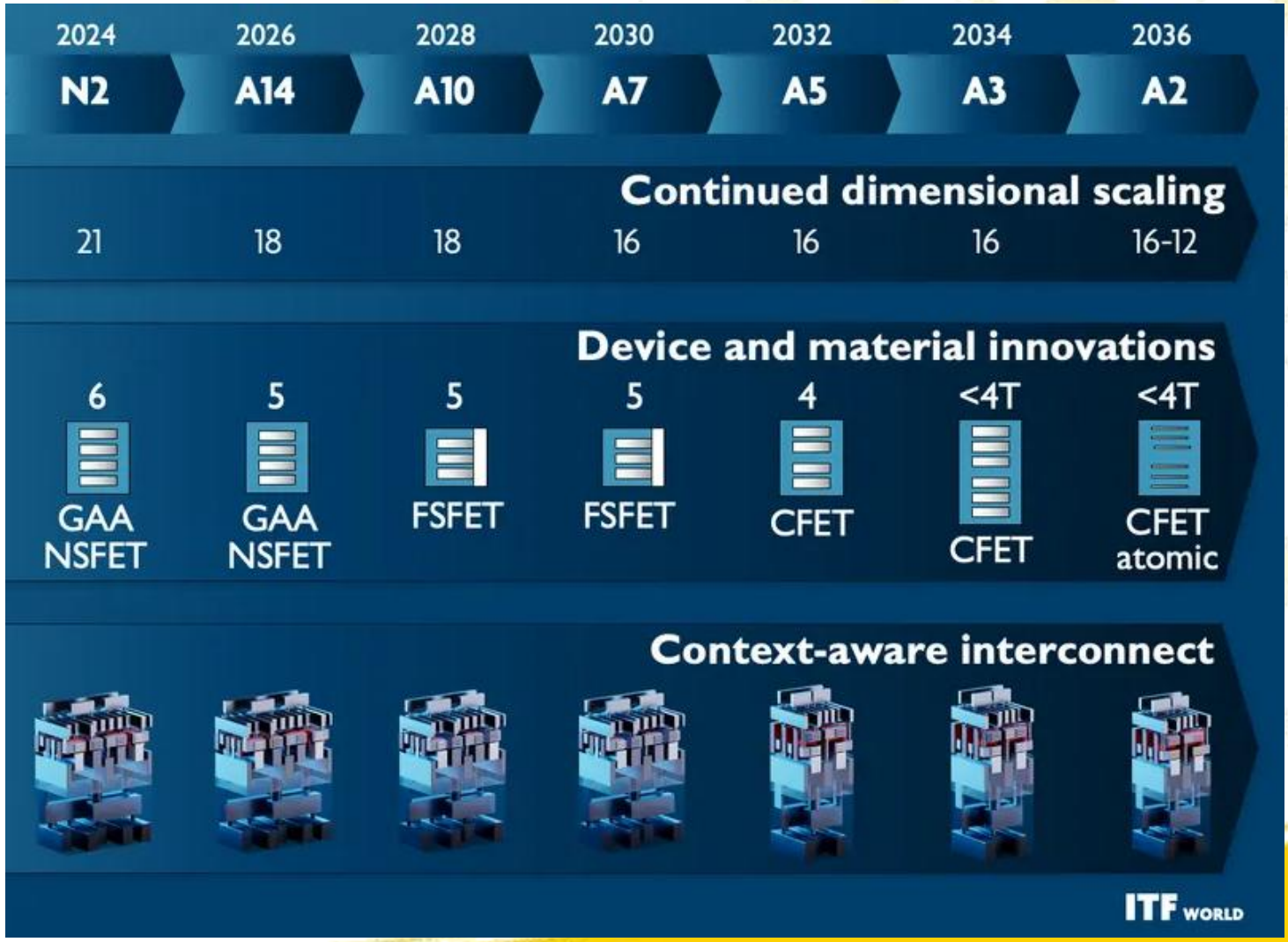
Angstrom-era process materials analysis – MSS‘s core competitiveness

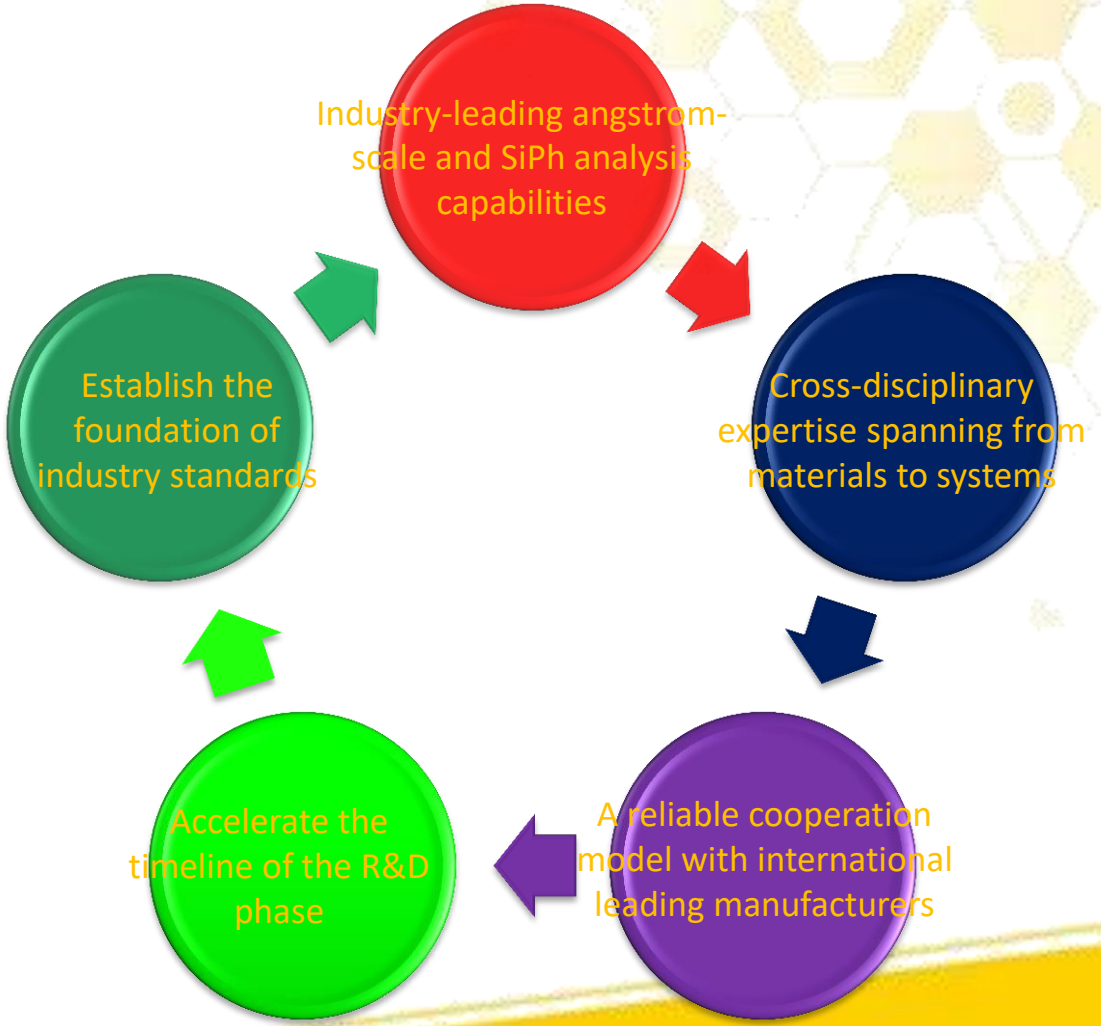
Collaboration with top-tier international manufacturers

- Sub-A resolution
- PR protection technology
- Low-k protection technology
- Super-thin lamella technology
- Auto-measurement technology



Expanding the 'AI Zone' — Deepening Collaboration with Global AI Leaders

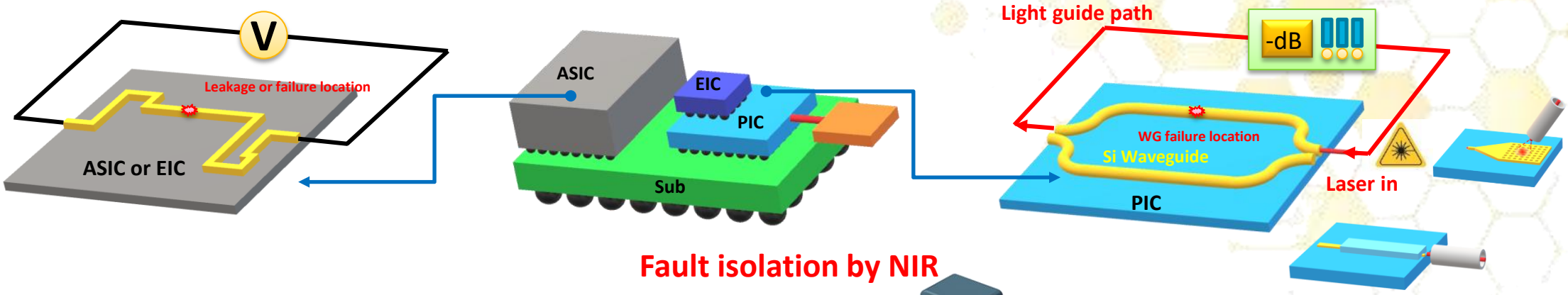
- Collaborating with a global leader in artificial intelligence to expand the AI zone
- Integrate cross-disciplinary expertise to develop unique silicon photonics analysis solutions
- Provide critical analytical techniques to address material and integration challenges in CPO and PIC



AI Analysis – MSS‘s Core Competitiveness

- **Advanced package**
  1. TSV sample preparation and analysis
  2. hybrid- bonding analysis tech.
  3. Hydra PFIB preparation tech.
  4. Large IC and substrate separation technology
  5. THz-TDR / Thermal XYZ / 3D X-ray analysis
- **FA for advanced package**
  1. Full layer parallel lapping technology
  2. Ion beam pretreatment technology
  3. Has been validated by multiple companies for their 3nm process node products

SiPh analysis

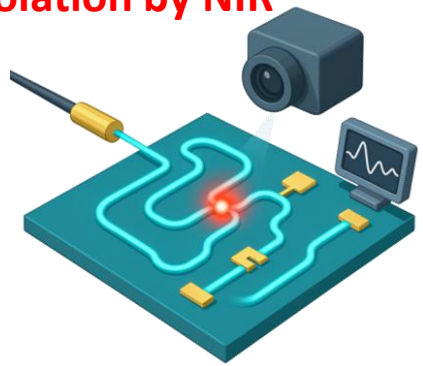


Measurements

- Laser: O-band (1310 nm), C+L-band (1550 nm)
- IL (Insertion Loss), RL (Return Loss) & PDL (Polarization dependent loss) test platforms
- OFDR, Spectrum / Transmission curve
- Grating / Edge coupler (GC/EC)
- XYZθ scan and NIR observation

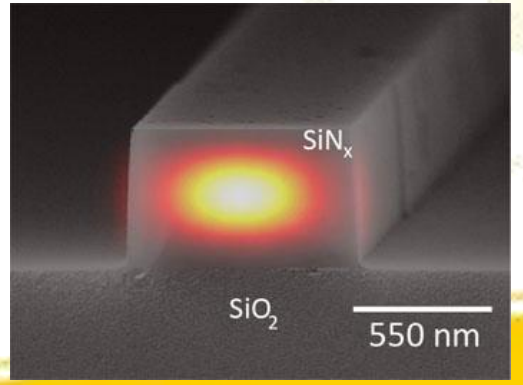
Granted patent (Taiwan、Japan、US):
Device for detecting optical loss (I870008)

Fault isolation by NIR



Root-cause identification

- SEM/FIB/TEM



SEM image of the waveguide cross-section of the low-noise frequency converter

Ref: https://www.nist.gov/image/fwmbsimagewebjpg

MSS HG (Helmet Gecko)

Live status of in-house equipment at MSS

Sales Version (Mechanical Schematic Diagram)

Standard functions:

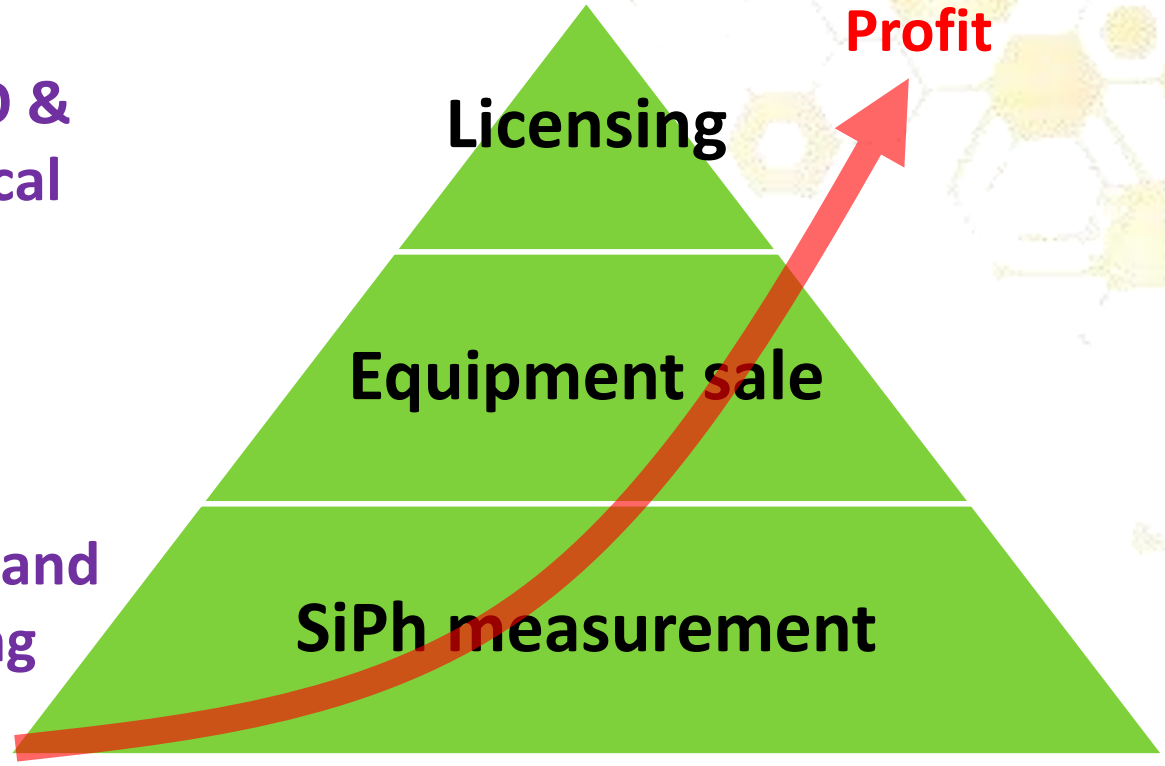
1. Automatic Laser Coupling Platform
2. IL / RL
3. Optical Loss & Leakage Localization
4. Swept Laser Measurement
5. Optical Intensity Variation Measurement (50 mW / 17 dBm)

Optional Features:

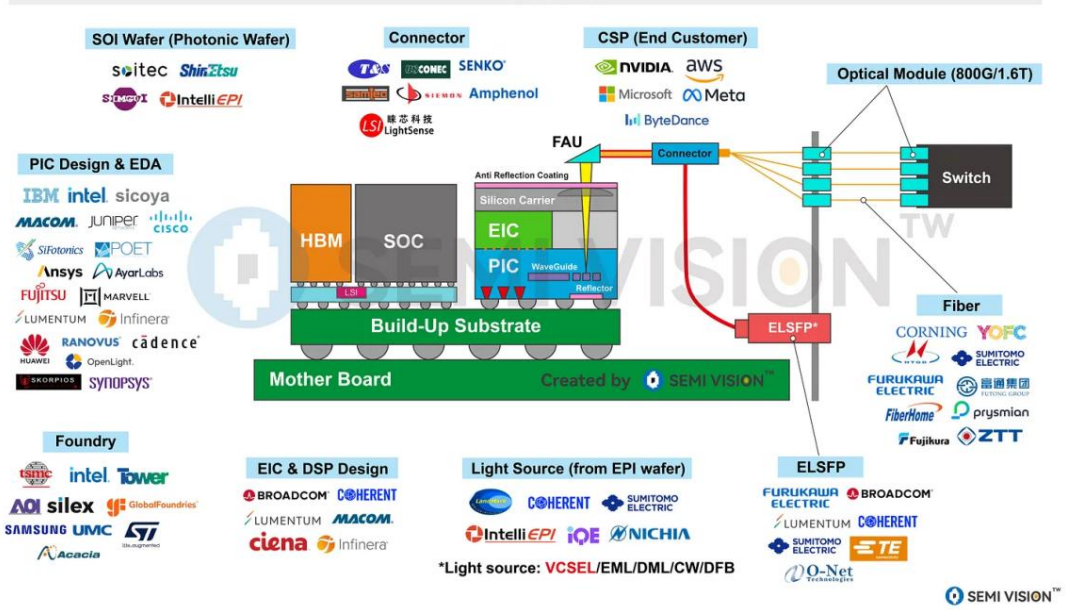
1. Optical Frequency Domain Reflectometry (OFDR)
2. High-Power Measurement (1000 mW)
3. High-Power Automatic Polarizer
4. Optical Polarization Measurement (PDL)
5. Switch Multi-Channel Measurement
6. OVNA Measurement (70 / 110 / 170 GHz)
7. Eye Diagram Measurement (70 / 110 / 170 GHz)
8. BERT Module (64 / 120 GBd)

High-value-added business model for SiPh

- Core service: Precision localization analysis for CPO & SiPh E-O, O-O, and O-E optical loss and fault points
- Extension: Equipment sales
- Revenue structure: Diverse and scalable technology licensing income



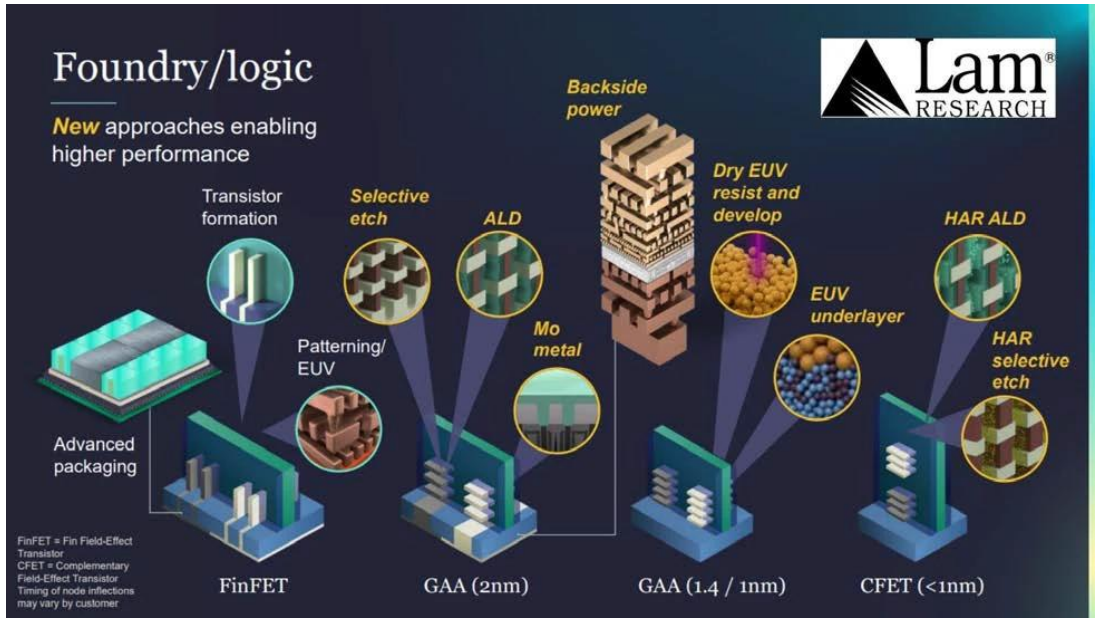
SiPh Analysis – MSS‘s Core Competitiveness

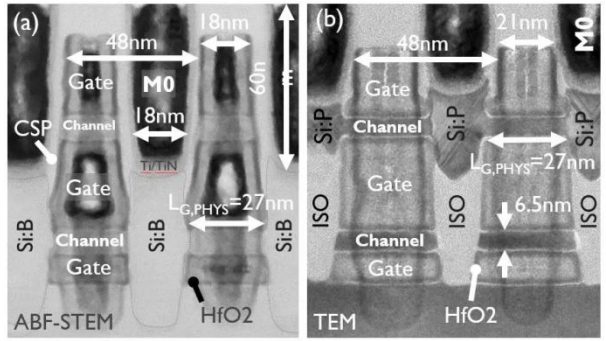


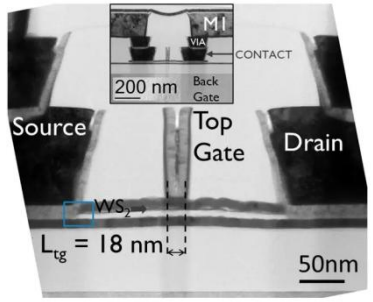
SiPh ecosystem

- **SiPh structure**
  1. Large-area preparation
  2. Precision positioning and lapping/polishing technology
  3. Conductive sample preparation method
  4. Low-curtaining artifact sample preparation method
- **SiPh photoelectricity test**
  1. Optical characterization and loss measurement for SiPh devices
  2. Optical path anomaly localization, break, and light leakage detection for SiPh components
  3. Fully automatic optical scanning 12-inch SiPh photometric platform

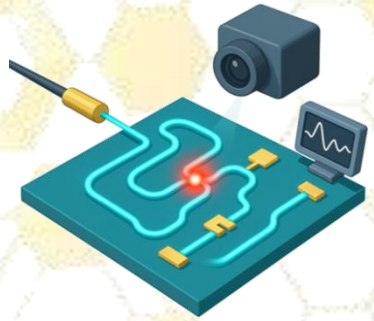
Strong demand for Angstrom-era materials analysis and SiPh analysis

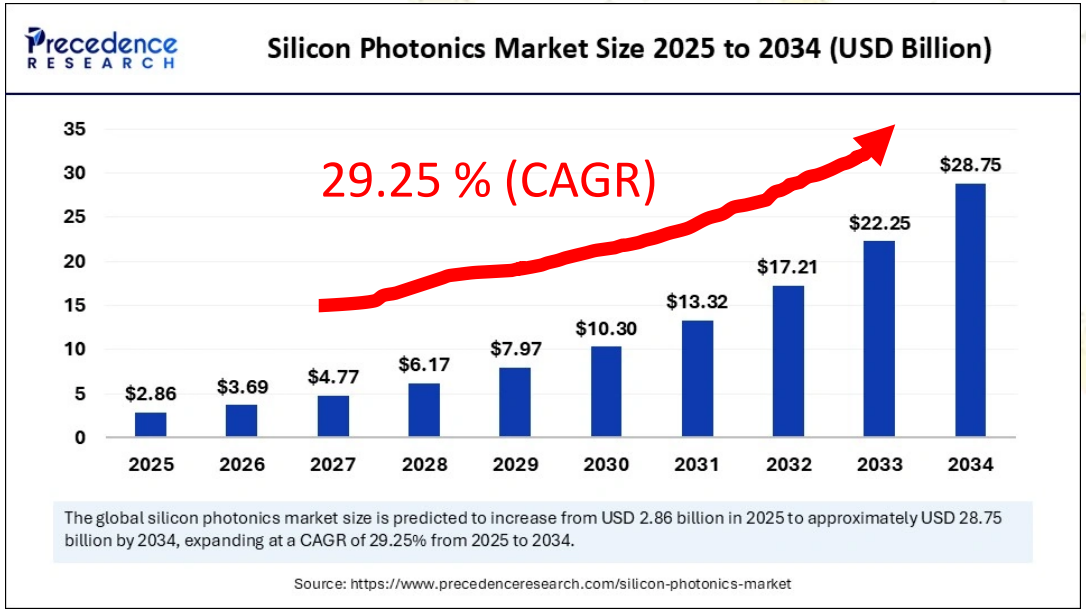






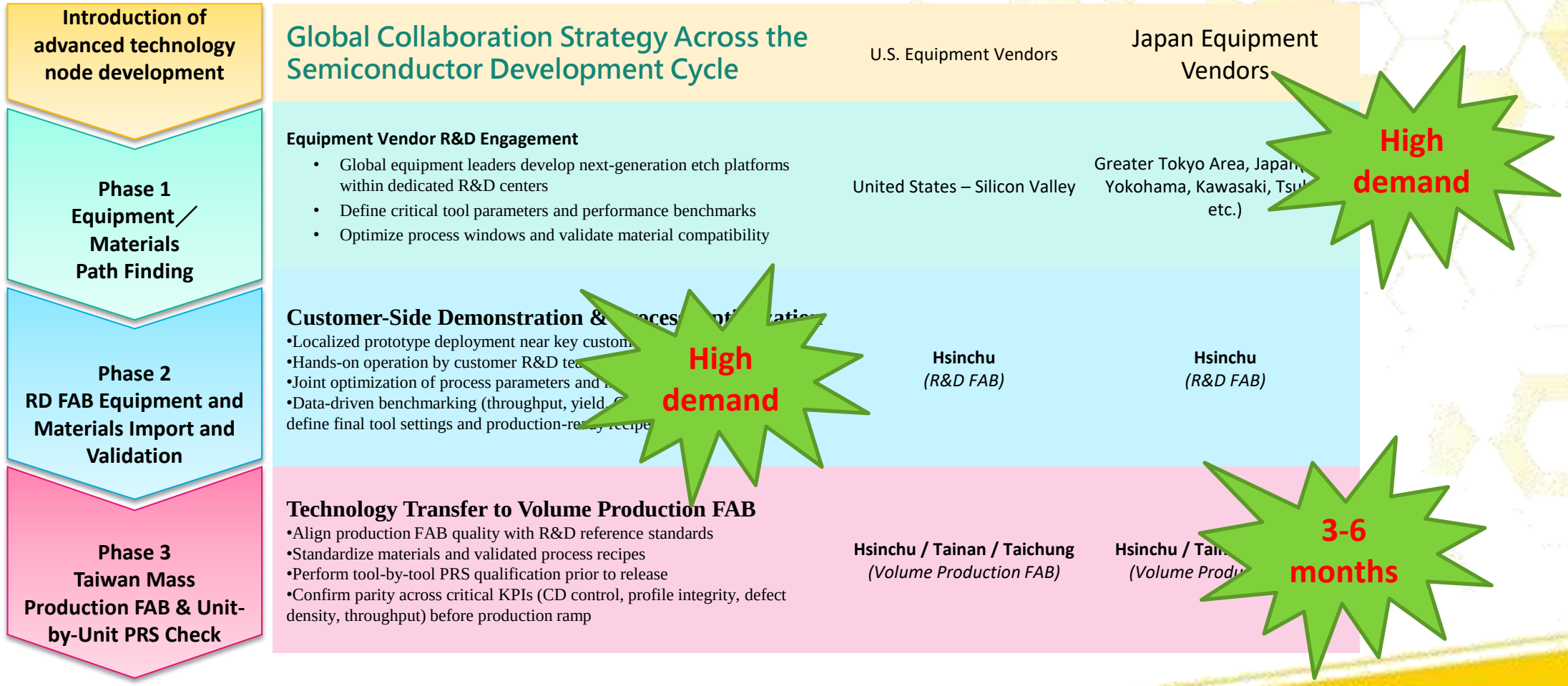
- **Precision – Atomic level**
- **Integrated analytical solutions**





(Left) End-of-process cross sectional images for (a) bottom pFET and (b) top nFET (LG,PHYS=27nm) (as presented at VLSI 2023). (Right) TEM image of a 2D device fabricated with 300mm processes. From imec

Strong demand from semiconductor equipment and material vendors



Our Winning Strategy – Innovative Analytical Technologies + In-House Equipment Development

More than ten multi-country patents, over 50 confidential (or proprietary) methodologies

- Advanced analytical technologies and R&D capabilities
- Strict PIP control and E-system
- Close collaboration with top-tier international customers
- High-end / experienced professional talent

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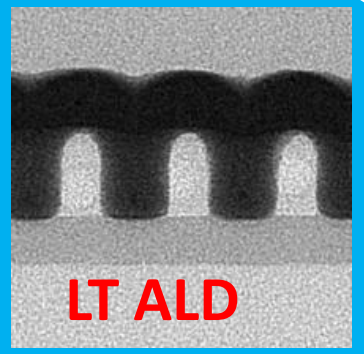
Patents granted in Taiwan, Japan, and the US

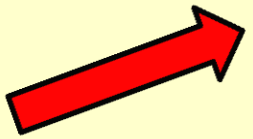
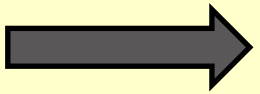
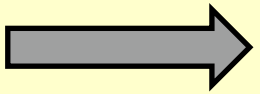
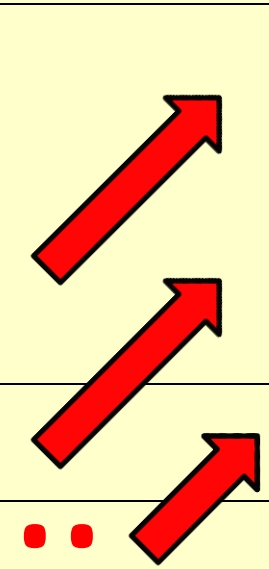


LT ALD

Laser decapsulation system

Thank you for listening, and welcome your guidance

Q&A

Item	Group	Technology	MSS niche	2025 Q4 Revenue Share	2026 Q4 Revenue Share	Expected growth in 2026-2027
先進製程(埃米世代)-Advanced processes (Angstrom era)	MA	PR protection technology	3rd generation EUV PR protection technology	54.3% (Quarter) 83.94 M (Month)	54.3% (Quarter) 83.94 M (Month)	
	MA		Advanced EUV PR protection technology			
	MA		Selective deposition sample preparation technology / Advanced material test platform			
	MA	low-*k* protection technology	BEOL: low-*k* structure protection technology			
	MA		BEOL: low-*k* damage analysis technology			
	MA		Novel 2D materials analysis method			
	MA	Ultra-thin sample method	Ultra-thin sample protection method			
	MA		FEOL: GAA etch byproduct bonding state analysis			
	MA		MEOL: ALE etch byproduct comparison platform / Precise etching depth verification technology			
	MA		High aspect ratio structural TEM analysis technology			
	MA	Auto-measurement	Artificial intelligence for automatic measurement / Etching depth morphology data analysis platform			
成熟製程 - Mature processes	MA	ML ball height/ML defect	Optical component analysis technology: ML ball height/ML defect	9.36% (Quarter) 14.49 M (Month)	7.2% (Quarter) 13.81 M (Month)	
	MA		Wearable device AR/VR product lens integration analysis			
	MA	Compound Semiconductor	Epitaxial defect quantitative analysis technology			
	MA		Carrier concentration distribution analysis in compound semiconductors			
	MA		Integrated stress analysis technology			
	MA	OLED	Ultra-low contrast imaging technology for layer structures			
	MA	CCL/FCCL	Soft material slicing technology			
	MA	General materials analysis (SEM/FIB CS/Reversed MA/SIMS)				
IC故障分析 - IC failure analysis	FA	Compound Semiconductor	High voltage and high temperature test (1000V, 300C)	10.6% (Quarter) 16.42 M (Month)	8% (Quarter) 15.36 M (Month)	
	FA		Ultrathin sample preparation technology for EFA			
	FA	Circuit edit technology	Signal lead technology			
	FA		Backside signal lead technology			
	FA		Adding external multiple passive components technology			
	FA		Precise local RDL removal technology			
	FA		Filpchip front side FIB technology / 5nm IC backside			
	FA	General failure analysis (decap/delayer/electrical property/CRD/IC Reverse/SAT/3D				
矽光子&AI晶片 - SiPh & AI Chip	MA	SiPh structure	SiPh / Large-area rapid cutting method / Conductive / Low-curtain effect preparation	7% (Quarter) 10.86 M (Month)	7.7% (Quarter) 14.81 M (Month)	
	FA	SiPh photoelectricity test	Light characteristics, IL test, waveguide, uLens			
	FA		Waveguide abnormality fault isolation, circuit break, light leakage detection test			
	FA		12-inch SiPh photometric platform, automatic scan coupling, high-power light source, temperature, device characteristic table			
	MA	Advanced package	PFIB / Hybrid metal bond / TSV analysis technology			
	FA	Advanced package FA	Full layer parallel lapping, um to nm fault isolation, pre-ion-beam preparation technology			
	FA	Advanced package	Large IC and substrate separation technology, THz-TDR / Thermal XYZ / 3D X-ray analysis, BGA reball			
海外 - Overseas	MA	Special ALD preparation / Super-thin lamella technology	Advanced PR protection / Low-k structure protection / High aspect ratio TEM technology	18.7% (Quarter) 29 M (Month)	32.4% (Quarter) 61.99 M (Month)	
矽光子測試設備HG銷售 - SiPh test & HG sales	EQ sales	IR test technology	Three self-assembled units are already stably serving multiple customers for SiPh R&D analysis, expanding the business model by leveraging existing technologies to assemble mass-production equipment for sale to customers			

Stable growth

Compound semiconductors

AI issue

Strengthen collaboration

China + Overseas

MSS HG

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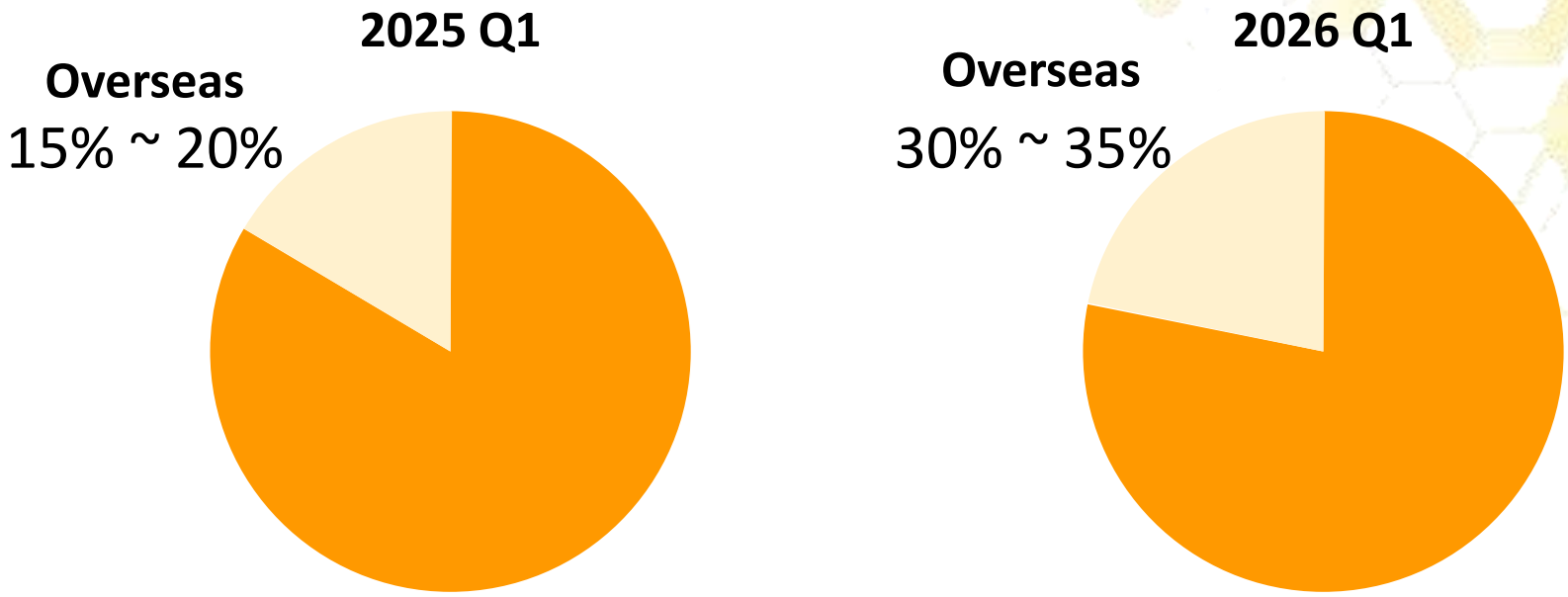
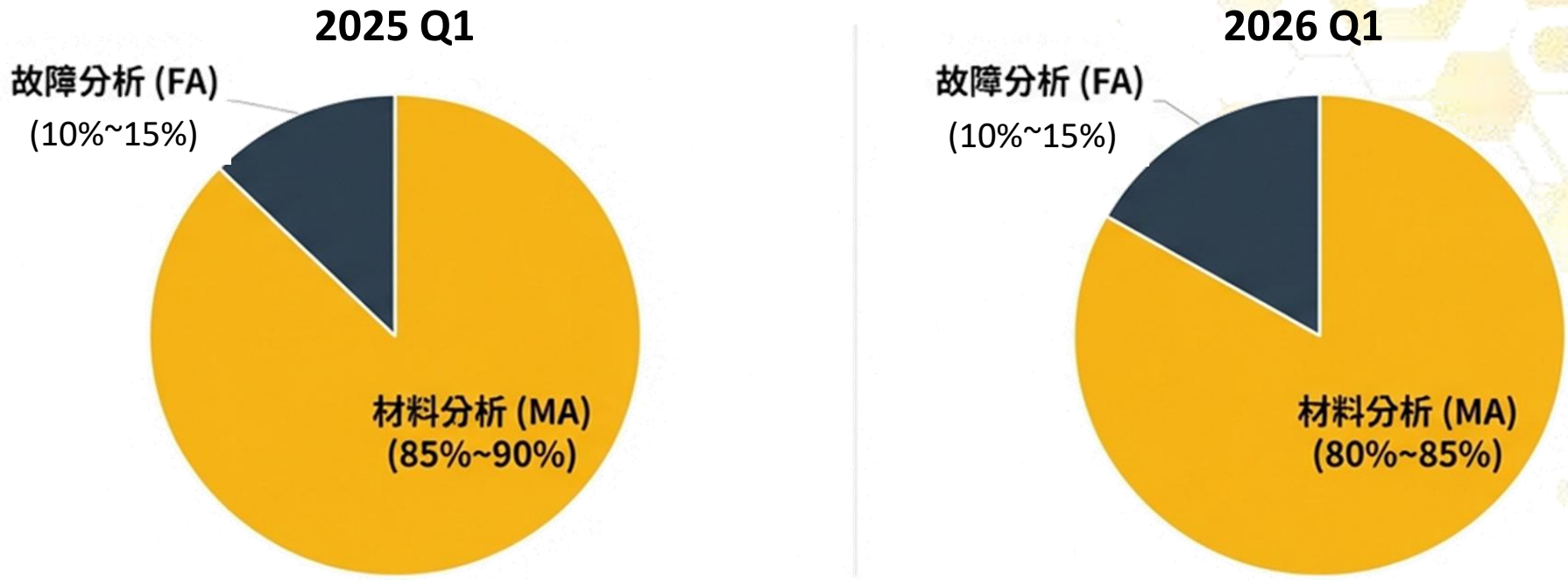
Key Institutional Investor Focus: Changes in Market Landscape



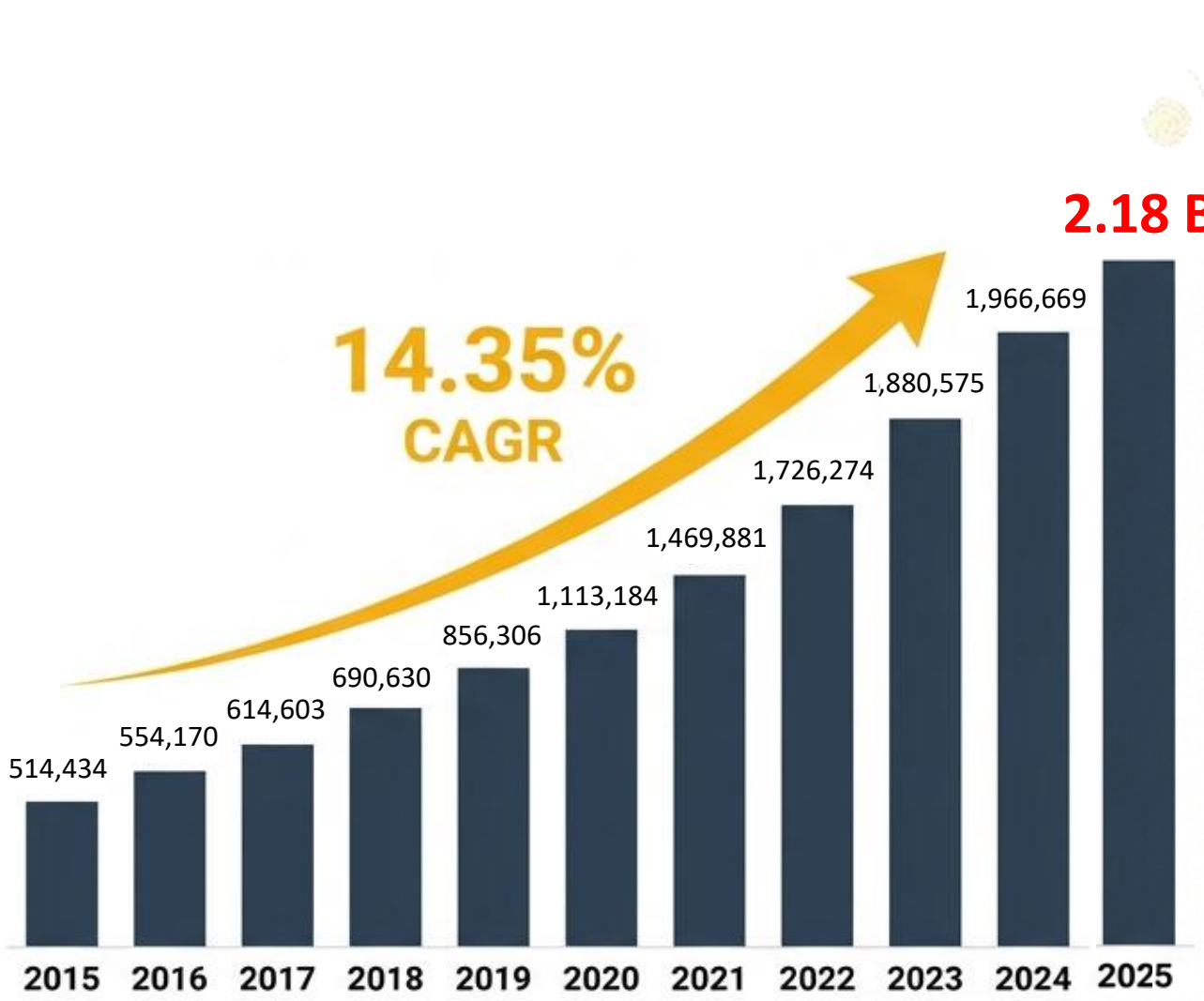
- Changing global market dynamics are opening new growth avenues and influencing our strategic positioning.
- Revenue exposure to Mainland China continues to rise, driven by accelerated semiconductor development and increasing demand for advanced materials characterization services

Key Institutional Investor Focus: Changes in Market Mix



Sustained >80% Mix of High-Barrier MA Services
Ensuring a Structurally Superior Gross Margin Profile

Strategic Inflection Point: From Steady Profit to Structural Explosion



2015-2025 Revenue Compound Growth Rate (CAGR)

Four Major Growth Drivers for 2026

Angstrom Generation

Silicon Photonics

AI Zone (Expansion of US Clients)

Global Layout

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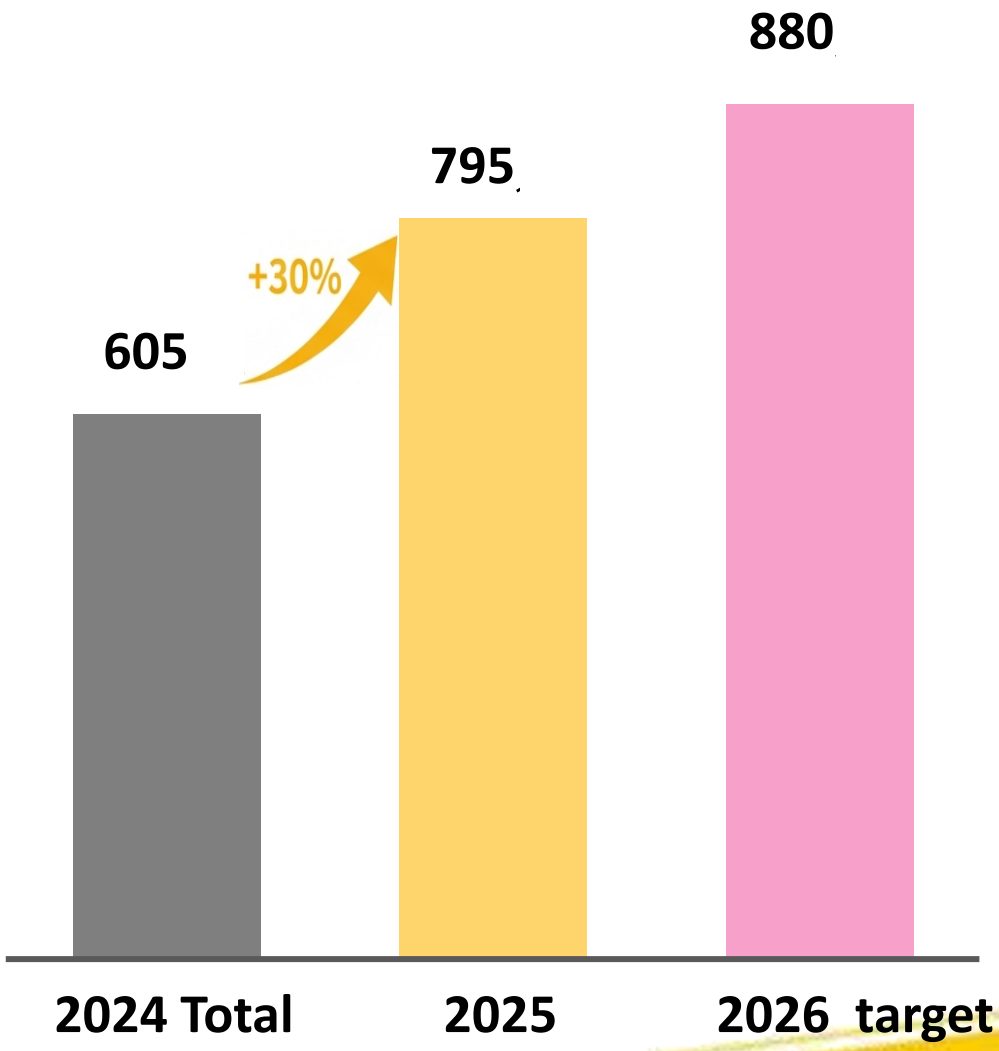
Talent Arms Race: Preparing for Explosive Demand in 2026



Strategic Investment in Human Capital.
Building a Strong Foundation for Sustainable Future Growth

Human Capital as a Growth Multiplier

- Scaling high-end technical talent aligned with advanced-node demand
- Strengthening silicon photonics testing and R&D capabilities

Execution capacity begins with people —
workforce readiness directly translates into scalable production output and revenue growth.

Company Overview

汎銓科技股份有限公司 (Msscorps Co., LTD)

設立時間 (Established)
民國94年7月27日
July 27, 2005

上市掛牌 (IPO)
民國111年8月31日
August 31, 2022

創辦人 (Founder)
柳紀綸董事長兼總經理
Mr. Gino Liu, Chairman & President

5.34億 (534 M)
資本額(新台幣)
Capital (NTD)

842
員工人數
Employees

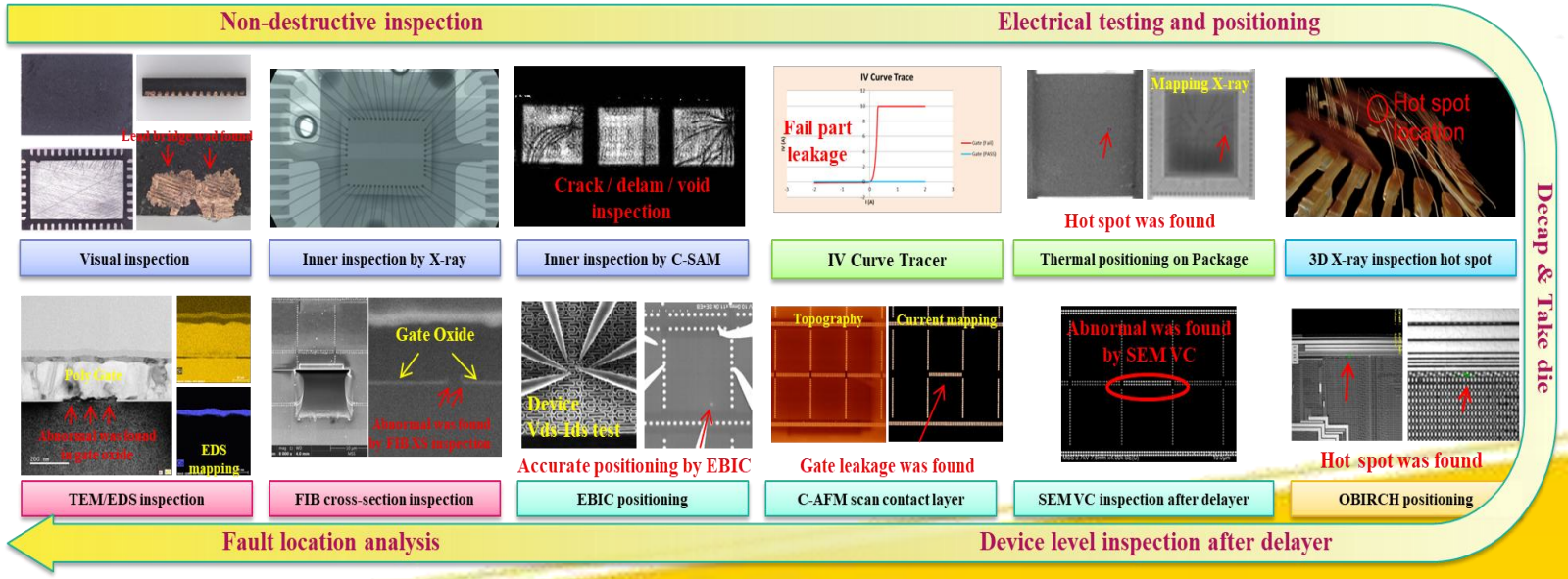
核心服務項目 (Core services)

- **Materials Analysis (MA) –** Providing advanced process R&D support to foundries and equipment/material suppliers
- **Failure Analysis (FA) –** Assisting IC design houses and manufacturers in rapid root cause identification and defect resolution

The role of MSS in the semiconductor industry supply chain-FA

Item & Positioning		Content
Failure analysis service (IC Hospital)	**IC Design / Photomask**	Resolving IC Design Errors and Identifying Root Causes of IC Failures to Accelerate Time-to-Market •IC debugging and repair, enabling designers to pinpoint design flaws and validate corrective actions •Post-production analysis of defective units, including re-measurement, fault localization, structural and compositional analysis using EFA & PFA technologies to determine root causes
	Packaging / Substrate / Flexible Board / PCB Applications	MSSCORPS' Low-Damage Analytical Technologies •Originated from leading foundry requirements and extended downstream across the semiconductor ecosystem •Increasing material diversity, hardness variation, thinner layers, and weaker interlayer bonding demand advanced protection techniques •Developed proprietary protection processes and patents to minimize thermal and electrical interference and prevent human-induced defects

Failure analysis Process

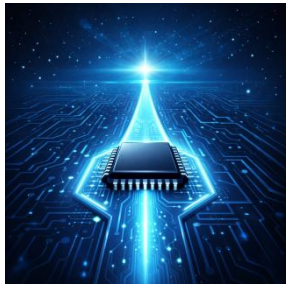


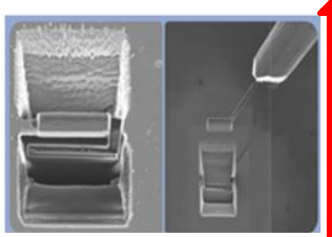
The role of MSS in the semiconductor industry supply chain-MA

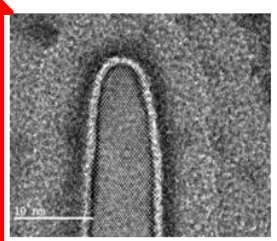
Item & Position	Content
Materials Analysis (R&D leader)  **Fab Eqpt. Materials**	Providing transistor structure and composition analysis enables FAB to quickly achieve the following tasks: 1. Developing state-of-the-art processes, determining new equipment models/new materials/process parameters 2. Implementing mass production; newly built production line equipment must demonstrate consistency with the RD line 3. During mass production, continuously improving production line yield
	If MSS's technology stagnates or slows down, our clients' R&D schedules will be delayed!

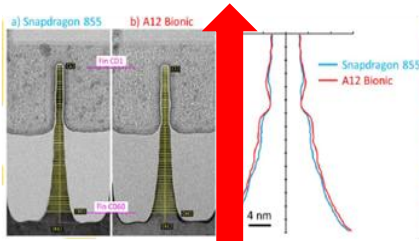
MA process

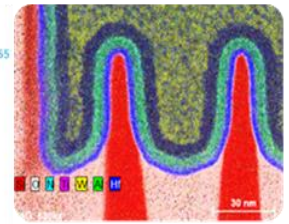
Case in Preparation → FIB FIB+Pick up → TEM Imaging+EDS → Data AI auto-meas. → Report Data org.











Patent

低溫原子層鍍膜專利	導電膠保護膜專利	原子層導電膜專利	影像自動量測專利	
Patent period	2020~2039	2022~2040	2022~2041	2022~2040

MSS SiPh patents

矽光子「光損偵測裝置」台灣、日本、美國 發明專利證書

中華民國專利證書

發明第 I870008 號

發明名稱：光損偵測裝置

專利權人：汎銓科技股份有限公司

發明人：柳紀綸、周學良、李宗育

專利權期間：自2025年1月11日至2043年9月5日止

上開發明業經專利權人依專利法之規定取得專利權

經濟部智慧財產局 局長 廖承威

中華民國 114 年 1 月 11 日

特許証

特許第7600349号

発明の名称 光損失測定装置

特許権者 台湾 300 新竹市埔頂路27號1樓

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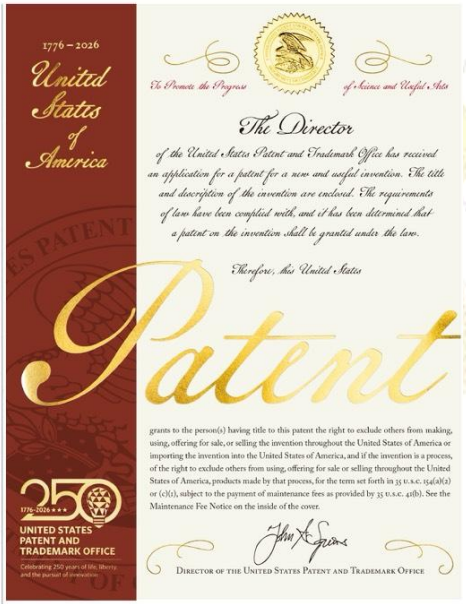
特許第7600349号



1776 – 2026

United States of America

The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

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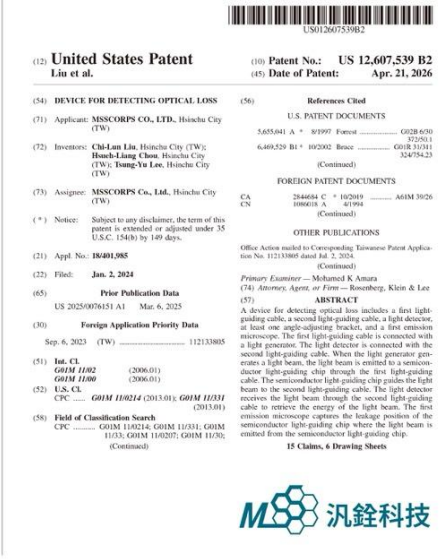

US012607539B2

(12) United States Patent
Liu et al.

(10) Patent No.: US 12,607,539 B2
(45) Date of Patent: Apr. 21, 2026

(54) DEVICE FOR DETECTING OPTICAL LOSS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 149 days.

(21) Appl. No.: 18/401,985

(22) Filed: Jan. 2, 2024

(65) Prior Publication Data

US 2025/0076151 A1 Mar. 6, 2025

(30) Foreign Application Priority Data

Sep. 6, 2023 (TW) 112133885

(51) Int. Cl.
G01M 11/02 (2006.01)
G01M 11/00 (2006.01)

(52) U.S. Cl.
CPC G01M 11/0214 (2013.01); G01M 11/331 (2013.01)

(58) Field of Classification Search
CPC G01M 11/0214; G01M 11/331; G01M 11/33; G01M 11/0207; G01M 11/30;
(Continued)

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(57) ABSTRACT

A device for detecting optical loss includes a first light-guiding cable, a second light-guiding cable, a light detector, at least one angle-adjusting bracket, and a first emission microscope. The first light-guiding cable is connected with a light generator. The light detector is connected with the second light-guiding cable. When the light generator generates a light beam, the light beam is emitted to a semiconductor light-guiding chip through the first light-guiding cable. The semiconductor light-guiding chip guides the light beam to the second light-guiding cable. The light detector receives the light beam through the second light-guiding cable to retrieve the energy of the light beam. The first emission microscope captures the leakage position of the semiconductor light-guiding chip where the light beam is emitted from the semiconductor light-guiding chip.

15 Claims, 6 Drawing Sheets

汎銓科技

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- The EDS(energy dispersive X-ray spectroscopy) analysis is a semi-quantitative , the concentration is NOT calibrated. It is NOT allowed to use as certification of product quality and process performance.
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